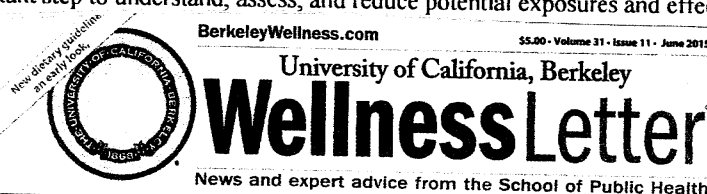


Volatile emissions from common consumer products

Abstract

Consumer products emit a range of volatile organic compounds (VOCs) that can affect air quality and health. Risk reduction is hindered because of lack of information about specific product emissions. This study investigates and compares VOCs emitted from 37 common products (air fresheners, laundry products, cleaners, and personal care products), including those with certifications and claims of green and organic. It extends a prior study of 25 consumer products by adding 12 more products, including fragrance-free versions of fragranced products, representing the first such comparison in the scientific literature. This study found 156 different VOCs emitted from the 37 products, with an average of 15 VOCs per product. Of these 156 VOCs, 42 VOCs are classified as toxic or hazardous under US federal laws, and each product emitted at least one of these chemicals. Emissions of carcinogenic hazardous air pollutants (HAPs) from green fragranced products were not significantly different from regular fragranced products. The most common chemicals in fragranced products were terpenes, which were not in fragrance-free versions. Of the volatile ingredients emitted, fewer than 3 % were disclosed on any product label or material safety data sheet (MSDS). Because health effects depend on many factors, not only individual ingredients, this study makes no claims regarding possible risks. However, knowledge of product composition can be an important step to understand, assess, and reduce potential exposures and effects.



Don't assume that "green" consumer products—those labeled organic, natural, nontoxic, or environmentally friendly—emit fewer risky chemicals into the air than their conventional counterparts. The terms have no legal definitions. In a recent study in *Air Quality, Atmosphere & Health*, 37 common products were tested for potentially harmful volatile chemicals, notably terpenes (such as pinene or limonene), which come from the oils of plants and are used as fragrances and solvents. The products included air fresheners, cleansers, detergents, soaps, deodorants, and shampoos. On average, each product emitted 15 volatile chemicals, many classified as toxic or hazardous by U.S. regulations. As prior studies have found, "green" products were just as likely to emit risky chemicals. Manufacturers are not required to disclose specific fragrance ingredients in household products (they may simply list "natural fragrance" on the label, for instance), so you usually have no way of knowing what's in them.

Air Quality, Atmosphere & Health
March 2013, Volume 6, Issue 1, pp 151-156
Date: 19 Aug 2011

Chemical emissions from residential dryer vents during use of fragranced laundry products

Abstract

Common laundry products, used in washing and drying machines, can contribute to outdoor emissions through dryer vents. However, the types and amounts of chemicals emitted are largely unknown. To investigate these emissions, we analyzed the volatile organic compounds (VOCs) both in the headspace of fragranced laundry products and in the air emitted from dryer vents during use of these products. In a controlled study of washing and drying laundry, we sampled emissions from two residential dryer vents during the use of no products, fragranced detergent, and fragranced detergent plus fragranced dryer sheet. Our analyses found more than 25 VOCs emitted from dryer vents, with the highest concentrations of acetaldehyde, acetone, and ethanol. Seven of these VOCs are classified as hazardous air pollutants (HAPs) and two as carcinogenic HAPs (acetaldehyde and benzene) with no safe exposure level, according to the US Environmental Protection Agency. As context for significance, the acetaldehyde emissions during use of one brand of laundry detergent would represent 3% of total acetaldehyde emissions from automobiles in the study area. Our study points to the need for additional research on this source of emissions and the potential impacts on human and environmental health.



★ Cleaning products and air fresheners: exposure to primary and secondary air pollutants

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Received 27 November 2003, Revised 11 February 2004, Accepted 25 February 2004, Available online 14 April 2004

doi:10.1016/j.atmosenv.2004.02.040

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Abstract

Building occupants, including cleaning personnel, are exposed to a wide variety of airborne chemicals when cleaning agents and air fresheners are used in buildings. Certain of these chemicals are listed by the state of California as toxic air contaminants (TACs) and a subset of these are regulated by the US federal government as hazardous air pollutants (HAPs). California's Proposition 65 list of species recognized as carcinogens or reproductive toxicants also includes constituents of certain cleaning products and air fresheners. In addition, many cleaning agents and air fresheners contain chemicals that can react with other air contaminants to yield potentially harmful secondary products. For example, terpenes can react rapidly with ozone in indoor air generating many secondary pollutants, including TACs such as formaldehyde. Furthermore, ozone-terpene reactions produce the hydroxyl radical, which reacts rapidly with organics, leading to the formation of other potentially toxic air pollutants. Indoor reactive chemistry involving the nitrate radical and cleaning-product constituents is also of concern, since it produces organic nitrates as well as some of the same oxidation products generated by ozone and hydroxyl radicals.

Few studies have directly addressed the indoor concentrations of TACs that might result from primary emissions or secondary pollutant formation following the use of cleaning agents and air fresheners. In this paper, we combine direct empirical evidence with the basic principles of indoor pollutant behavior and with information from relevant studies, to analyze and critically assess air pollutant exposures resulting from the use of cleaning products and air fresheners. Attention is focused on compounds that are listed as HAPs, TACs or Proposition 65 carcinogens/reproductive toxicants and compounds that can readily react to generate secondary pollutants. The toxicity of many of these secondary pollutants has yet to be evaluated. The inhalation intake of airborne organic compounds from cleaning product use is estimated to be of the order of $10 \text{ mg d}^{-1} \text{ person}^{-1}$ in California. More than two dozen research articles present evidence of adverse health effects from inhalation exposure associated with cleaning or cleaning products. Exposure to primary and secondary pollutants depends on the complex interplay of many sets of factors and processes, including cleaning product composition, usage, building occupancy, emission dynamics, transport and mixing, building ventilation, sorptive interactions with building surfaces, and reactive chemistry. Current understanding is sufficient to describe the influence of these variables qualitatively in most cases and quantitatively in a few.

Keywords

Indoor air quality; Hazardous air pollutants; Terpenes; Ozone; Hydroxyl radical; Nitrate radical

Environ Health Perspect. 2012 Jul;120(7):935-43. doi: 10.1289/ehp.1104052. Epub 2012 Mar 8.

★ **Endocrine disruptors and asthma-associated chemicals in consumer products.**
Dodson RE1, Nishioka M, Standley LJ, Perovich LJ, Brody JG, Rudel RA.

Author information

Abstract

BACKGROUND:

Laboratory and human studies raise concerns about endocrine disruption and asthma resulting from exposure to chemicals in consumer products. Limited labeling or testing information is available to evaluate products as exposure sources.

OBJECTIVES:

We analytically quantified endocrine disruptors and asthma-related chemicals in a range of cosmetics, personal care products, cleaners, sunscreens, and vinyl products. We also evaluated whether product labels provide information that can be used to select products without these chemicals.

METHODS:

We selected 213 commercial products representing 50 product types. We tested 42 composited samples of high-market-share products, and we tested 43 alternative products identified using criteria expected to minimize target compounds. Analytes included parabens, phthalates, bisphenol A (BPA), triclosan, ethanolamines, alkylphenols, fragrances, glycol ethers, cyclosiloxanes, and ultraviolet (UV) filters.

RESULTS:

We detected 55 compounds, indicating a wide range of exposures from common products. Vinyl products contained > 10% bis(2-ethylhexyl) phthalate (DEHP) and could be an important source of DEHP in homes. In other products, **the highest concentrations and numbers of detects were in the fragranced products (e.g., perfume, air fresheners, and dryer sheets) and in sunscreens.** Some products that did not contain the well-known endocrine-disrupting phthalates contained other less-studied phthalates (dicyclohexyl phthalate, diisononyl phthalate, and di-n-propyl phthalate; also endocrine-disrupting compounds), suggesting a substitution. **Many detected chemicals were not listed on product labels.**

CONCLUSIONS:

Common products contain complex mixtures of EDCs and asthma-related compounds. Toxicological studies of these mixtures are needed to understand their biological activity. Regarding epidemiology, our findings raise concern about potential confounding from co-occurring chemicals and misclassification due to variability in product composition. **Consumers should be able to avoid some target chemicals-synthetic fragrances, BPA, and regulated active ingredients-using purchasing criteria. More complete product labeling would enable consumers to avoid the rest of the target chemicals.**

PMID:

22398195

[PubMed - indexed for MEDLINE]

PMCID:

PMC3404651

Free PMC Article

Olfactory symptoms reported by migraineurs with and without auras.

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Abstract

OBJECTIVE:

Olfaction-related symptoms accompany migraine attacks and some, such as osmophobia, may be useful in differentiating migraine from other types of headaches. However, the types and frequencies of olfactory symptoms associated with migraine have not been well characterized. The goal of this study was to better characterize the olfactory symptoms of migraine.

METHODS:

A cross-sectional study was devised. One hundred and thirteen patients who met the International Classification of Headache Disorders II criteria for migraine were administered a new 65-item questionnaire specifically focused on olfaction-related experiences (eg, odor-related triggers, osmophobia, cacosmia, phantosmia, olfactory hallucinations, olfactory hypersensitivity, and self-perceived olfactory function). Visual analog scale ratings and frequencies were computed and compared between migraineurs with and without auras using t-tests and chi-square analyses.

RESULTS:

While osmophobia was present in 95.5% of the patients, the prevalence of other olfaction-related symptoms was much lower (interictal olfactory hypersensitivity [IOH], 14.1%; olfactory hallucinations, 6.2%; phantosmia, 4.4%; cacosmia/euosmia, 2.6%). **Migraine was commonly triggered by odors (90.2%), with perfume being the most common trigger (95.1%),** followed by cleaning products (81.3%), cigarette smoke (71.5%), and motor vehicle exhaust (70.5%). No significant differences in symptom frequencies were apparent between migraineurs with or without auras ($P > .40$). Interestingly, patients with IOH reported being less likely to experience osmophobia and odor-triggered crisis than did those without this symptom (respective percentages: 75% vs. 99% and 69%

vs. 94%, $P \leq .002$). Osmophobia and odor triggered headache were associated with a mild decrease in self-reported olfactory acuity.

CONCLUSION:

Odor-related disturbances were common symptoms of the 113 migraineurs, with nearly all reporting osmophobia. Perfume odor was the most common trigger for the migraine. The reported symptoms did not differ between patients with and without auras. Patients who experienced IOH appeared to fundamentally differ from those who did not experience IOH in terms of the incidence of osmophobia and odor-triggered crisis. Subjects who reported experiencing osmophobia and odor-triggered headache reported having worse olfactory acuity.

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KEYWORDS:

aura; migraine; olfactory symptoms

PMID:27779326

DOI:10.1111/head.12973

[PubMed - in process]



John Swartzberg, M.D.
Chair, Editorial Board

Safer cosmetics

Concerns about known or suspected endocrine disruptors such as phthalates and parabens have been mounting in recent years. Found in cosmetics, shampoos, and other personal care products, as well as some foods, plastics, and fabrics, these chemicals can mimic or interfere with the function of hormones.

Animal studies have linked endocrine disruptors, even at very low doses, with developmental, reproductive, neurological, immune, and other problems, and some research suggests that they adversely affect human health in similar ways, though there is still debate about this. The risks are likely to be greatest during pregnancy and infancy.

These endocrine disruptors are everywhere, which makes them hard to avoid and hard to study in the real world, since nearly everyone has low levels in their bodies.

One special area of concern is teenage girls. Women use twice as many personal care products as men—an average of 12 a day—and teenage girls tend to use the most, so they have high exposure to endocrine disruptors. Since teens are undergoing reproductive development, they're likely to be particularly susceptible to these chemicals, which may be absorbed by the skin or inhaled as fragrances.

That's why teenage girls were the focus of a study by researchers at the Center for Environmental Research and Children's Health here at UC Berkeley, published recently in the journal *Environmental Health Perspectives*. I have two teenage and two preteen grand-

daughters, so I am very interested in these findings.

Cosmetics and personal care products are only lightly regulated in the U.S., and ingredients lists on labels are often incomplete or non-existent. Phthalates, for instance, are used as fragrances and thus are considered proprietary, so manufacturers don't have to list them.

How can these compounds be avoided, then? That was the question addressed by the new study. The researchers didn't test products in a lab, since consumers can't do that themselves. Instead, they tried to identify safer products based on their labels—for instance, by making sure no parabens, phthalates, or "fragrance" were listed in their ingredients.

They then recruited 100 teenage girls from the Salinas Valley in central California. Urine tests showed that 90 percent of them had elevated levels of endocrine disruptors, similar to nationwide findings. The girls were asked to stop using their regular personal care products and instead choose from those the researchers had selected as being less likely to contain such chemicals. Three days later, urine tests revealed that levels of the chemicals had fallen by 25 to 45 percent, showing that it is possible to identify products that are lower in endocrine disruptors solely by reading labels.

Beyond reading the labels, are there other ways to find safer personal care products for you and your family? Kim Harley, one of the authors of the study, recommends the Environmental Working Group's Skin Deep database (ewg.org/skindeep), which allows you to search more than 60,000 products, and the Campaign for Safe Cosmetics (safecosmetics.org), which provides guidance about how to avoid potentially risky chemicals in products. Both websites have phone apps for scanning barcodes on products while you shop.

http://www.npr.org/2015/09/22/442189543/what-s-that-smell-when-workplaces-try-fragrance-bans?sc=17&f=1001&utm_source=iosnewsapp&utm_medium=Email&utm_campaign=app

What's That Smell?! When Workplaces Try Fragrance Bans

SEPTEMBER 22, 2015 5:11 AM ET

By NPR's Julie Luetttgen

As a girl, Julie Luetttgen hid in her room to escape her mother's Estee Lauder perfume. As an adult, she finds scents inescapable.

"Everywhere I go — theaters, I've been at restaurants — and it's like, 'Oh my God, do you smell that?' It's terrible," she says.

Luetttgen, a Realtor in Milwaukee, says her nose keeps tabs on co-workers as they come and go. "I can tell who's been in there just by the smell," she says.

This isn't a party trick. For her, fragrances can trigger debilitating migraines. To avoid it, she has clients drive in separate cars. She removes scented plug-ins from homes. And she plans carefully before heading into the office.

"I will text co-workers and just say, 'Hey, if you're going to be in today, I've got a headache or I'm feeling ill. Could you please not wear cologne?' If my boss is going to clean the office, he'll let me know in advance, and I won't go into the office that day," she says.

There is a medical condition called "multiple chemical sensitivity," but it occupies a gray legal and medical area.

It's not clear how many suffer from it, though the Society for Human Resource Management says fragrance policies are among the top five inquiries it gets from members. And it's not always clear what an employer is required to do.

Scott Pollins is an employment lawyer representing a Pennsylvania woman who recently settled a case against her former employer. "It can be difficult to figure out what's reasonable and what's not reasonable," Pollins says.

Under the Americans with Disabilities Act, if an employee has a diagnosed medical condition such as asthma or an allergy triggered by a fragrance, the employer must make accommodations. But the Occupational Safety and Health Administration says it's not clear how far an employer must go to accommodate.

Partial print of article.

Are Your Cleaning Products Causing Your Migraines?

Migraines can be triggered by particularly strong scents and odors, as well as certain volatile organic compounds with little to no scent. Discover which products and ingredients may be causing your migraines, and get tips for reducing them!

<https://www.motherearthliving.com/your-natural-home/cleaning-products-causing-migraines-zb0z1805>

From The Migraine Relief Center

A migraine can be triggered by particular scents and odors. You may have experienced a headache yourself if you worked next to someone wearing heavy perfume or walked into a public restroom with an industrial sanitizer in use.

Smells are not the only thing that can cause a migraine to start. Certain volatile chemicals, even those with little odor, can cause nausea and headaches in some people. If you notice that you develop migraines after a bout of housecleaning, it's possible your cleaning products are to blame.

Cleaning Products Can Trigger Migraines

In fact, cleaning products are one of the most commonly reported triggers for migraines. To be technical, the chemicals contained in many cleaning products directly irritate the trigeminal nerve receptors in the nasal lining. Migraine sufferers are particularly sensitive to this type of irritation.

It's no wonder, considering the chemicals in many of them. Migraines are not only painful; they steal your time and energy that you would rather use for almost anything else.

A cleaning product may have any or all of the following: fragrance, solvents, and irritants.

The fragrance is typically used to mask the odor of solvent.

Solvents include alcohols, propylene glycol, glycol ethers, and others. Irritants include kerosene and formaldehyde.

These chemicals are known as VOCs or volatile organic compounds.

Some organic compounds not only trigger migraines and other illnesses, but some are also carcinogenic over long use or in high-exposure situations.

While not strictly cleaning products, today's consumer preference for automatic air fresheners and scent defusing devices may have a negative impact on your health. You may have noticed that going to a friend or family member's home seems to result in a migraine, and it isn't because of tension or stress.

Reducing Migraines During Cleaning

Unfortunately, the house doesn't clean itself. And not everyone wants or can afford a cleaning service. There are several things you can do to prevent a migraine the next time you need to mop the floor, dust, or scrub.

Bleach, Pine-Sol, Febreze, and other heavily scented products tend to cause problems in people with sensitive noses and a tendency towards migraines. Petroleum-based scents especially seem to linger on furniture and in carpets.



Unscented versions of your current products may be available. Selecting an unscented aerosol or liquid may be the only change you need to make....

The Prevalence and Impact of Migraine and Severe Headache in the United States: Figures and Trends From Government Health Studies.

Burch R¹, Rizzoli P¹, Loder E¹.

Author information

Abstract

BACKGROUND AND OBJECTIVES:

In this targeted systematic review, we aimed to identify up-to-date prevalence estimates of migraine and severe headache in adults from population-based US government surveys. Our goal was to assess the stability of prevalence estimates over time, and to identify additional information pertinent to the burden and treatment of migraine and other severe headache conditions.

METHODS:

We searched for the most current publicly available summary statistics from the National Health Interview Survey (NHIS), the National Hospital Ambulatory Medical Care Survey (NHAMCS), and the National Ambulatory Medical Care Survey (NAMCS). We extracted and summarized data from each study over time and as a function of demographic variables.

RESULTS:

The prevalence and burden of self-reported **migraine** and severe headache in the US adult population is high, affecting roughly 1 out of every 6 American and **1 in 5 women** over a 3-month period (15.3% overall [95% CI 14.75-15.85], **9.7% of males** [95% CI 9.05-10.35] and **20.7% of females** [95% CI 19.84-21.56]). The prevalence has been remarkably stable over a period of 19 years. The prevalence of migraine or severe headache in 2015 was highest in American Indian or Alaska Natives (18.4%) compared with whites, blacks, or Hispanics, with the lowest prevalence in Asians (11.3%). There is a higher burden of migraine in those aged 18-44 (17.9%), people who are unemployed (21.4%), those with family income less than \$35,000 per year (19.9%), and the elderly and disabled (16.4%). Headache is consistently the fourth or fifth most common reason for visits to the emergency department, accounting for roughly 3% of all emergency department visits annually. In reproductive aged women, headache is the third leading cause of emergency department visits.

CONCLUSIONS:

Severe headache and migraine remain important public health problems that are more common and burdensome for women, particularly women of childbearing age, and other historically disadvantaged segments of the population. These inequities could be exacerbated if new high-cost treatments are inaccessible to those who need them most.

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KEYWORDS:

epidemiology; headache; migraine; prevalence

PMID:29527677

DOI:[10.1111/head.13281](https://doi.org/10.1111/head.13281)

Skip The Fabric Softener

EWG.ORG

By Megan Boyle, HCHW Editorial Director and Samara Geller, Database Analyst

THURSDAY, MAY 5, 2016

Originally published on Healthy Child, Healthy World by Megan Boyle and Samara Geller.

Using fabric softeners sounds like a no-brainer. These common laundry products promise soft, fresh-smelling clothes, free of static and wrinkles, along with less stretching, fading and pilling. But in-wash fabric softeners and heat-activated dryer sheets pack a powerful combination of chemicals that can harm your health, damage the environment and pollute the air, both inside and outside your home.

EWG recommends skipping fabric softeners entirely. Here are the worst chemicals to watch for in your laundry basket – and what to use instead.

“Quats” Quaternary ammonium compounds make clothes feel soft and wearable right out of the wash, but they’re known to trigger asthma and may be toxic to our reproductive systems.

Check labels and product websites for these ingredients: distearyldimonium chloride, diethyl ester dimethyl ammonium chloride, variants of hydroxyethyl methyl ammonium methyl sulfate or the vague terms “biodegradable fabric softening agents” and “cationic surfactant.” Avoid them all.

Fragrance There are more than 3,000 fragrance ingredients in common household products – and scarcely any way to know what they are.

Your fabric softener may contain phthalates, which disperse the scent; synthetic musks such as galaxolide, which accumulate in the body; and much more. Fragrance mixes can cause allergies, skin irritations such as dermatitis, difficulty breathing and potential reproductive harm. Research indicates that scents also cause irritation when vented outdoors, especially for asthmatics and those sensitive to chemicals. Not worth it.

Preservatives and Colors Like fragrance, the terms “preservatives” and “colors” or “colorants” on an ingredient label may refer to any number of chemicals. The most worrisome preservatives in fabric softeners include methylisothiazolinone, a potent skin allergen, and glutaral, known to trigger asthma and skin allergies. Glutaral (or glutaraldehyde) is also toxic to marine life. Among artificial colors, D&C violet 2 has been linked to cancer. Others may contain impurities that can cause cancer. So skip fabric softeners and conditioners in any form – pellets, crystals, bars or single-dose packs. You won’t notice the difference.

Or you can try these ideas instead:

*Try adding half a cup of distilled white vinegar to your washing machine during the rinse cycle. Don’t worry: the smell doesn’t linger on clothes.

*If you’re not line-drying, run the drying machine with just your clothes inside. (To reduce static, do not over-dry.) Not only do dryer sheets contain a variety of chemicals, but neither plant-based nor polyester types are reusable, creating extra waste.

*Try 100 percent wool dryer balls. Makers of these solid balls of felted wool, or felted wool wrapped around a fiber core, say wool or its natural lanolin soften laundry and reduce static. Generally safe for sensitive skin and babies, the balls also lift and separate clothes in the dryer, shortening drying time and saving energy.

You can buy **ready-made balls** or make your own with wool batting or wool yarn. Look for unscented versions and always be leery of essential oils, which can cause allergic reactions after just few contacts.

Learn more about **laundry products** and other home cleaners in the 2016 edition of EWG’s **Guide to Healthy Cleaning**.

Comment: I’ll just say I got them from Amazon. You can search for Sheep soft wool dryer balls.